REMARKS

Claims 1-16 are all the claims pending in the application. Reconsideration and allowance of all the claims are respectfully requested in view of the following remarks.

Drawings

The Examiner objected to the drawings as not showing every feature as specified in the claims. Specifically, the Examiner asserted that the "grease" (as claimed in line 4 of claim 1) and "the interference of the seal lip of the seal" must be shown.

With respect to the grease, Applicants have submitted herewith a proposed drawing correction to Fig. 9, wherein the grease is shown.

With respect to the "interference of the seal lip", Applicants respectfully traverse this objection because the drawings do, indeed, show this feature. That is, as shown in Fig. 9, the axial interference of the seal lip 22 is shown at "A".

The Examiner asserts that the axial clearance is interpreted "to be the distance from the vertical distance from element 2 to element 3".[1] The Examiner's interpretation of "axial clearance" is, respectfully, wrong. That is, the vertical direction in Fig. 9 is the radial direction, i.e., the direction from the inner ring 3 towards the outer ring 2. As more easily understood from viewing Fig. 1, the axial direction is that along the shaft 8, i.e., the horizontal direction in both Figs. 1 and 9. Further, a patent need not teach, and preferably omits, what is well known in the art.[2] And the term "axial clearance" is a term that is well known in the art; it means the amount of relative movement between the inner and outer rings of the bearing in the axial direction. Please note NSK's technical literature as submitted herewith for the Examiner's convenience. That is, the "axial clearance" is a property of the bearing. Thus, because the term "axial clearance" is known in the art, and a depiction thereof is not necessary to the understanding of the invention, it has not been shown.

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[1] Office Action at page 2, lines 3-5.

[2] *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 3 USPQ2d 1737 (Fed. Cir. 1987).

Specification

The Examiner objected to the disclosure as including informalities. Specifically, the Examiner asserted that on page 1, line 7, "rings 0" should be --rings zero--. Applicants have amended the specification so as to put it in better idiomatic English with respect to the lack of relative rotation between the rings. Accordingly, this objection is believed to have been overcome.

Claim Objections

The Examiner objected to claim 1 as including informalities. Specifically, the Examiner asserted that in line 8 of claim 1, "when said clutch mechanism and shaft" should be --when said clutch mechanism and said shaft--. Applicants have amended this portion of claim 1 so as to recite "said shaft".

Claim Rejections - 35 U.S.C. § 112

The Examiner rejected claims 1-16 under §112, 2nd paragraph, as indefinite. The Examiner cited various instances of indefiniteness in item 7 on pages 3 and 4 of the Office Action. In response, Applicants have amended in part, and respectfully traverse this rejection in part, as set forth below.

With respect to claim 1, line 4, Applicants have changed the phrase "therein" to --in said rolling bearing--.

Further, with respect to the "effective clearance" and the "initial radial clearance", as used in claim 1, Applicants respectfully traverse this rejection because the claim is clear as written. That is, the "initial radial clearance" and "effective clearance" are terms of art that would be readily understood by a person of ordinary skill. The "initial radial clearance" is that within the bearing itself when not mounted within a machine, whereas the "effective radial clearance" is that as measured when the bearing is fitted within a machine. Again, submitted herewith, for the Examiner's convenience, is some of NSK's technical literature explaining the various clearances within a bearing. Accordingly, in this regard, claim 1 is clear as written.

With respect to claims 3-16, Applicants have amended them in a manner believed to overcome this rejection. In doing so, however, such an amendments do not narrow the claims, they merely redefine or rearrange what was already included and, therefore, do not subject the claims to prosecution history estoppel. See: *Turbocare Corp. v. General Electric Co.*, 60 USPQ.2d 1017 (Fed. Cir. August 29, 2001) (*Festo*[3] is not applicable to a claim wherein a limitation is only redefined without narrowing the claim.). Further, the Applicant's redrafting of the claims in response to the § 112 rejection was done strictly for cosmetic purposes and not for narrowing the scope of the existing claims. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 2002 U.S. LEXIS 3818, *27 (May 28, 2002) ("If a 35 U.S.C. § 112 amendment is truly cosmetic, then it would not narrow the patent's scope or raise an estoppel.").

Claim Rejections - 35 U.S.C. § 103

The Examiner rejected claims 1 and 9 under §103(a) as being unpatentable over Japanese Patent JP 2000-74052 (using US Patent Application Publication 2002/0054720 to Obara as an English equivalent) (hereinafter Obara) in view of US Patent 5,655,844 to Takano (hereinafter Takano) and JP 2000-119673 (using US Patent 6,329,326 to Iso et al. as an English equivalent) (hereinafter Iso). Applicants respectfully traverse this rejection because the references fail to establish *prima facie* obviousness in that they do not teach or suggest all the elements as set forth in Applicants' claims, and there is no motivation for combining the references as suggested by the Examiner.

First, the references fail to teach or suggest all the elements as set forth in Applicants' claims.

Claim 1 sets forth a rolling bearing structured such that a plurality of rolling elements are held between inner and outer rings by a retainer, wherein a rotary body provided with the outer ring and a shaft provided with the inner ring can be connected together by a clutch mechanism.

[3] *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 56 USPQ.2d 1865 (Fed. Cir. 2000) (*en banc*), *vacated and remanded*, 2002 U.S. LEXIS 3818, (May 28, 2002).

The Examiner cites Obara as teaching a clutch mechanism 27, 29.[4] However, the Examiner's interpretation of Obara is wrong. Obara describes elements 27 and 29 in the section entitled "The Embodiment of the Spindle Motor", and specifically sets forth these elements as "rotor magnets 27 made of permanent magnets" and "a coil 29" of stator 30. That is, the magnets 27 are placed on rotor hub 24 which is "a rotating member of the motor", whereas the coil 29 is placed on stator 30 in order to provide a motor that spins the disk drive device.[5] Nowhere does Obara teach or suggest a clutch mechanism whereby the rotor hub 24 is locked together with the base 21 or shaft 1 attached thereto. In fact, the base 21 and shaft 1 remain stationary while the rotor hub 24 spins. In such a manner, information contained on a disk associated with the rotor hub 24 can be accessed.

The Examiner cites Iso as teaching grease used as a lubricant in a rolling bearing, and Takano as teaching the use of an initial radial clearance. However, neither one of these references teaches or suggests a clutch mechanism.

Accordingly, for the sake of argument, even assuming that one of ordinary skill in the art were motivated to combine the references as suggested by the Examiner, any such combination would still not teach or suggest a clutch mechanism as set forth in Applicants' claim 1.

Second, there is no motivation to combine the references as suggested by the Examiner.

Takano teaches the use of a "slight positive gap inside the second ball bearing" of two ball bearings that are subject to an axial load. First, Takano describes the problems with various configurations of bearings that support both radial and axial loads.[6] Takano then sets forth that his bearing unit has been developed in view of solving those problems.[7] That is, Takano

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[4] Office Action at page 5, lines 3-9.

[5] Obara at paragraph 72.

[6] Takano at col. 1, line 10 - col. 3, line 63.

[7] Takano at col. 3, lines 66-67, and col. 4, line 36 - col. 5, line 34.

provides a "slight positive gap" in the second ball bearing so that the first ball bearing [which carries most of the axial load] also supports part of the radial load."[8]

But the bearings in Obara's disk drive apparatus are not subject to any appreciable axial load. Accordingly, one of ordinary skill in the art, looking at the teachings of the references as a whole, would not have been motivated to use the teachings of Takano—relating to bearing units for supporting both axial and radial loads—to modify Obara's bearing unit that is not subject to any appreciable axial load.

For at least any of the above reasons, claim 1 is not rendered obvious by Obara in view of Takano and Iso. Likewise, dependent claim 9 is not rendered obvious by these references.

The Examiner rejected claims 2-8 and 10-16 under §103(a) as being unpatentable over Obara in view of Takano and Iso, and further in view of various ones or combinations of the following references: US Patent 4,371,220 to Brucher; US Patent 4,629,337 to Teramachi; and US Patent 4,650,195 to Dreschmann et al. Applicants respectfully traverse these rejections because the references fail to establish *prima facie* obviousness in that they do not teach or suggest all the elements as set forth in Applicants' claims, and there is no motivation for combining the references as suggested by the Examiner.

As noted above, the Examiner's attempted combination of Obara in view of Takano and Iso is deficient. Further, the additionally cited references fail to teach or suggest anything that would cure the deficiencies in the Examiner's attempted combination of Obara in view of Takano and Iso. Accordingly, none of claims 2-8 and 10-16 are rendered obvious by the various combinations of references as suggested by the Examiner.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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[8] Takano at col. 5, lines 18-21.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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WASHINGTON OFFICE

23373
PATENT TRADEMARK OFFICE

Date: January 9, 2003

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Page 1, the first paragraph has been amended as follows:

The present invention relates to a rolling bearing structured such that a rotary body with an outer ring fitted therewith and a shaft with an inner ring fitted therewith can be connected together by a clutch mechanism and, when the rotary body and shaft are connected together by the clutch mechanism, with [the] no relative rotation between the inner and outer rings [0], the rolling bearing can be used on receiving a rotation load; and, in more particular, to an improvement in such rolling bearing which can prevent occurrence of fretting in the bearing raceway surfaces thereof to thereby enhance the life thereof.

Page 3, the second full paragraph has been amended as follows:

And, as described above, especially, in case where the bearing effective clearance is set small, that is, for example, the bearing effective clearance is [0] zero, contact positions between the respective rolling elements 4 and raceway surface 3a remain unchanged. Therefore, variations in the above-mentioned load acting on the rolling body 4 cause slight slippage between the mutual contact surfaces of the raceway surface 3a and rolling body 4 and thus, in case where the rolling body 4 collides repetitively with the raceway surface 3a at the same position, there occurs fretting which gives rise to local wear on the raceway surface 3a. This local wear causes strange sounds and reduces the life of the bearing. Or, due to worn powder produced in the local wear, the life of the grease can be shortened.

Page 4, the first full paragraph has been amended as follows:

The invention aims at eliminating the above-mentioned problems found in the conventional rolling bearings. Accordingly, it is an object of the invention is to provide a rolling bearing which, with [the] no relative rotation between inner and outer rings [zero], can be used on receiving a rotation load, wherein there is eliminated a fear of incurring the complication of a process for manufacturing the component parts of the rolling bearing, fretting can be prevented inexpensively

and positively, generation of strange sounds and reduction in the life of the bearing due to local wear caused by such fretting can be prevented, and reduction in the life of grease due to worn powder produced in the local wear can be prevented.

The paragraph bridging pages 4 and 5 has been amended as follows:

In attaining the above object, according to the invention, there is provided a rolling bearing structured such that a plurality of rolling elements are held between inner and outer rings by a retainer, grease is sealed in by a seal, a rotary body with the outer ring fitted therewith and a shaft with the inner ring fitted therewith can be connected together by a clutch mechanism, and, when the rotary body and shaft are connected together by the clutch mechanism, with [the] no relative rotation between the inner and outer rings [zero], the rolling bearing can be used on receiving a rotation load, wherein an initial radial clearance between the inner and outer rings is set in such a manner that a bearing effective clearance when the bearing is incorporated between the rotary body and shaft provides a positive value.

The paragraph bridging pages 5 and 6 has been amended as follows:

Also, in case where the clutch mechanism is held in the on-state, the rotary body and shaft are connected together by the clutch mechanism in such a manner that they can be rotated integrally, so that there is no [the] relative rotation between the inner and outer rings of the rolling bearing [provides zero].

Page 6, the first full paragraph has been amended as follows:

However, even in case where the inner and outer rings of the rolling bearing rotate [while their] together, i.e., with no relative rotation [is zero], since the bearing effective clearance in the radial direction is previously set at a positive value, as shown in Fig. 3, the rolling elements, correspondingly to the rotation of the inner and outer rings, shifts not on the actual raceway surface of the inner ring but on a virtual inscribed circle shown by broken lines in Fig. 3. In other words, as shown by the arrow marks (A) - (E) in Figs. 3 (a) - (e), when the rotation load direction moves with the rotation of the inner and outer rings, due to the difference between the circumference length of

the virtual inscribed circle and the circumference length of the actual raceway surface of the inner ring, the contact position of the rolling element with the actual raceway surface of the inner ring gradually shifts counterclockwise in Fig. 3.

Page 6, the second full paragraph has been amended as follows:

Therefore, as described above, also in case where the inner and outer rings of the rolling bearing are driven or rotated with [the] no relative rotation [zero] in the clutch-on state, there can be prevented fretting in which the rolling element collides repetitively with the raceway surface of the inner or outer ring at the same position thereof.

Page 12, the second full paragraph has been amended as follows:

In the clutch-off state shown in Fig. 1, a rotation force input to the rotary body 6 is not transmitted to the shaft 8, but the outer and inner rings 2 and 3 of the rolling bearing 1 can be rotated with respect to each other. On the other hand, in the clutch-on state shown in Fig. 2, since the rotary body 6 and shaft 8 are rotated integrally due to the rotary force input to the rotary body 6, the relative rotation between the outer and inner rings 2 and 3 of the rolling bearing 1 is [0] zero.

The paragraph bridging pages 14 and 15 has been amended as follows:

The present inventors, in order to confirm the above-mentioned operation effects due to the bearing effective clearance, checked the presence or absence of the movement of the rolling body (retainer) on the raceway surface with respect to previously-set bearing effective clearances. The results of the [our] check are shown in Fig. 4.

Page 20, the second full paragraph and insert has been amended as follows:

That is, the invention may also apply to a structure such as a rolling bearing for use in a crankshaft, in which, when an electromagnetic clutch is on, the shaft 8 serves as a drive side and the rotary body 6 rotates with [the] no relative rotation [zero]; and, when the electromagnetic clutch is off, the rotary body 6 rotates through the belt, whereas the shaft 8 remains stationary.